UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)
	10/829,013	LEWIS, MICHAEL C.
	Examiner	Art Unit
	Jin-Cheng Wang	2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 16-21* is/are rejected.

7)☒ Claim(s) *15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1.   The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

2.   A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application, and all other rejections have been overcome. See 37 CFR 1.130(b).

3.   Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4.   Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Pat. No. 6,369,828. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reason: The elements of the present application's claim 1 constitute a subset of the elements of the patented claim 1, only the element of the patented application's claim 1 is moved to claim 2 as is dependent on claim 1 of the present application. To be more specific, the

patented application's claim 1 has an additional limitation of "updating the at least one active region to include each of the at least one new region" over the claim 1 of the present application. The present application has instead set forth the above-mentioned limitation in claim 2 that is dependent on claim 1 of the present application. Therefore, it would have been obvious to one of ordinary skill in the art to make the claim made in this application, because it is only a subset of what has been, claimed before.

Allowable Subject Matter

5.   Claim 15 is objected to as being dependent upon rejected base claim (claim 12), but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6.   The following is a statement of reasons for the indication of allowable subject matter: Nothing in the prior art anticipates or suggests, "the region generator further include: the region list for indicating the at least one active region for the pixel; the intersection generator coupled with the region list determining at least one new region for the at least one active region and providing the region list with the at least one new region" in a system for providing anti-aliasing of a graphical image (claim 12).

Claim Rejections - 35 USC § 102

7.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8.   Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ned Greene 1996 ACM-0-89791-746-4/96/008 titled "Hierarchical Polygon Tiling with Coverage Masks".

9.   Claim 1:

The Greene reference has taught a method for providing antialiasing of a graphical image on a display (see the abstract), the graphical image generated from data describing at least one object (such as samples), the display including a plurality of pixels (see the abstract), the at least one object including the plurality of pixels (see page 1 of the introduction), each of the plurality of fragments including an indication of a portion of a corresponding pixel that is intersected (see section 2.2 in page 66 of the reference), the method comprising the steps of:

(a) Providing at least one active region for the pixel, each of the at least one active region intersecting a first portion of the pixel (i.e., the vacant region in figure 1 of page 67);

(b) Providing at least one new region, a first portion of the at least one new region indicating where in the pixel the at least one active region and the fragment intersect (e.g., covered region together with the region A in figure 1 of page 67), a second portion of the at least one new region indicating where in the pixel the at least one active region and the fragment do not intersect (e.g., vacant region, see figure 1b-1e of page 67); and

(c) Blending a portion of the fragment in a second portion of the pixel (e.g., covered region together with the region A in figure 1 of page 67) corresponding to the first portion of the at least one new region (figure 1b-1e of page 67).

The Office interprets the first portion of the at least one new region as the covered region together with the region A in figure 1 of page 67 of the reference.

Claim 2:

The claim 2 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of

(d) Updating the at least one active region to be the at least one new region; and

(e) Repeating (b) through (d) for each remaining fragment in the portion of the plurality of fragments; and

(f) Providing antialiased data for the pixel based on a second portion of the plurality of fragments that have been blended.

However, the Greene reference further discloses the claimed limitation of

(d) Updating the at least one active region to be the at least one new region (figure 1e, and section 3.1 in page 68 of the reference);

(e) Repeating (b) through (d) for each remaining fragment in the portion of the plurality of fragments (the front-to-back traversal of polygons (i.e., fragments) in the scene, section 4.1 in page 69 of the reference); and

(f) Providing antialiased data for the pixel based on a second portion of the plurality of fragments that have been blended (e.g., the triage coverage mask in page 67 of the reference).

Claim 3:

The claim 3 encompasses the same scope of invention as that of claim 2 except additional claimed limitation of

(g) Repeating steps (a) through (f) for each of the plurality of pixels. However, the Greene reference further discloses the claimed limitation of repeating steps (a) through (f) for each of the plurality of pixels (block of pixels in page 67 of the reference).

Claim 4:

The claim 4 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of coverage mask and intersecting the coverage mask for the fragment with each of the at least one active region to provide an intersection mask for each of the at least one active region. However, the Greene reference further discloses the claimed limitation of coverage mask (i.e., the triage coverage mask) and intersecting the coverage mask for the fragment (i.e., the coverage mask for the polygon) with each of the at least one active region to provide an intersection mask for each of the at least one active region (figure 1 in page 67 of the reference).

Claim 5:

The claim 5 encompasses the same scope of invention as that of claim 4 except additional claimed limitation of

(b2) Updating an active region if the active region has an intersection mask that covers the active region (figure 1 of page 67); and

(b3) Splitting the active region into a first new region (covered region) and a second new region (region A) if the active region is not the same as the intersection mask, the first new region corresponding to the intersection mask and being part of the first portion of the at least one new region, the second new region being part of the second portion of the at least one new region.

However, the Greene reference further discloses the claimed limitation of

(b2) Updating an active region if the active region has an intersection mask that covers the active region (figure 1 of page 67); and

(b3) Splitting the active region into a first new region (covered region) and a second new region (region A) if the active region is not the same as the intersection mask, the first new region corresponding to the intersection mask and being part of the first portion of the at least one new region, the second new region being part of the second portion of the at least one new region (figure 1 of page 67).

Claim 6:

The claim 6 encompasses the same scope of invention as that of claim 5 except additional claimed limitation that

(c) for each of the at least one active region, blending the portion of the fragment in a second portion of the pixel corresponding to the intersection mask. However, the Greene reference further discloses the claimed limitation that for each of the at least one active region, blending the portion of the fragment in a second portion of the pixel (e.g., covered region together with the region A in figure 1 of page 67) corresponding to the intersection mask.

Claim 7:

The claim 7 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that each of the plurality of pixels further includes a plurality of subpixels, wherein the first portion of the at least one new region indicates a first portion of the plurality of subpixels in which each of the at least one active region and the fragment intersect, wherein the second portion of the at least one new region indicates a second portion of the plurality of subpixels in which each of the at least one active region and the fragment do not intersect.

However, the Greene reference further discloses the claimed limitation that each of the plurality of pixels further includes a plurality of subpixels, wherein the first portion of the at least one new region indicates a first portion of the plurality of subpixels in which each of the at least one active region and the fragment intersect (e.g., covered region together with the region A in figure 1 of page 67), wherein the second portion of the at least one new region indicates a second portion of the plurality of subpixels in which each of the at least one active region and the fragment do not intersect (e.g., vacant region, see figure 1b-1e of page 67).

Claim 8:

The claim 8 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that each of the plurality of fragments further includes a color, and wherein blending step further includes the step of blending the color of the fragment in the first portion of the at least one new region. However, the Greene reference further discloses the claimed limitation that each of the plurality of fragments further includes a color, and wherein blending step further includes the step of blending the color of the fragment in the first portion of the at least one new region (polygon color, see page 68 of the reference).

Claim 9:

The claim 9 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of a single new region. However, the Greene reference further discloses the claimed limitation of a single new region (page 67 of the reference).

Claim 10:

The claim 10 encompasses the same scope of invention as that of claim 1 except additional claimed limitation that the at least one new region includes a plurality of new regions,

wherein the first portion of the at least one new region includes at least one of the plurality of

new regions, and wherein the second portion of the at least one new region includes at least one

remaining region of the plurality of new regions. However, the Greene reference further

discloses the claimed limitation that the at least one new region includes a plurality of new

regions, wherein the first portion of the at least one new region includes at least one of the

plurality of new regions, and wherein the second portion of the at least one new region includes

at least one remaining region of the plurality of new regions (page 67 of the reference). The

Office interprets a region of the claimed invention as the region covering a subpixel area.

10.   Claim 11:

        The Greene reference has taught a method for providing antialiasing of a graphical image

on a display (see the abstract), the graphical image provided from data describing at least one

object (such as samples), the display including a plurality of pixels (i.e., block of pixels, see also

the abstract), the at least one object including the plurality of pixels (see the introduction), a

portion of the plurality of fragments intersecting a pixel of the plurality of pixels (figure 1 in

page 65 of the reference), each of the plurality of fragments including a coverage mask (triage

mask) indicating of a portion of a corresponding pixel that is intersected (see section 2.2 in page

66 of the reference), the method comprising the steps of:

        (a) Providing at least one active region for the pixel, each of the at least one active region

intersecting a first portion of the pixel (i.e., the vacant region in figure 1 of page 67);

(b) Intersecting the coverage mask for the fragment (i.e., the coverage mask for the polygon) with each of the at least one active region to provide an intersection mask for each of the at least one active region (figure 1 in page 67 of the reference).

(c) For each of the at least one active region, updating an active region if the active region has an intersection mask that is the same as the active region (figure 1 of page 67); and

(d) For each of the at least one active region that is not the same as the intersection mask, splitting the active region into a first new region (covered region) and a second new region (region A), the first new region being the intersection mask and the second region being a complement of the intersection mask, the first new region being added to the at least one active region and the second new region an update of the active region (figure 1 of page 67).

(e) Blending a portion of the fragment in a second portion of the pixel (e.g., covered region together with the region A in figure 1 of page 67) corresponding to the intersection mask for each of the at least one active region (figure 1b-1e of page 67).

(f) Repeating steps (a) through (e) for each of the plurality of fragments intersecting the pixels (the front-to-back traversal of polygons (i.e., fragments) in the scene, section 4.1 in page 69 of the reference).

Claim Rejections - 35 USC § 103

11.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12.   Claim 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ned Greene

1996 ACM-0-89791-746-4/96/008 titled "Hierarchical Polygon Tiling with Coverage Masks",

further in view of Kurt Akeley 1993 ACM-0-89791-601-8/93/008 titled "RealityEngine

Graphics".

(a) The claims 12-14 encompasses the same scope of invention as that of claim 1 except

additional claimed limitation of a system for providing antialiasing of a graphical image

comprising a display, an antialiasing unit, an accumulator, a region generator and a blending

unit.

(b) The Greene reference has taught a polygon tiling algorithm (a method) for providing

antialiasing of a graphical image on a display (see the abstract).

(c) The Greene reference however does not particularly disclose the hardware for

implementing his method.

(d) Nevertheless, the Akeley reference has expressly taught a system for providing

antialiasing of a graphical image (see the abstract) comprising a display (section 2.6 of the

reference), an antialiasing unit (section 3.1 of the reference), an accumulator (sections 4.1 and

4.2), a region generator (e.g., section 2.4 of the reference) and a blending unit (e.g., section 2.5 of

the reference).

(e) One of ordinary skill in the art at the time the invention was made would have

recognized the Greene's method can be implemented in Akeley's system because a graphical

image must be displayed on a display device, antialiasing must be facilitated by an antialiasing

unit, and blending must be implemented on a blending unit. The Office takes Official Notice of

this teaching.

(f) Therefore, it would have been obvious to implement Greene's method on a graphical

system such as Akeley's system, because it would facilitate the displaying, processing, and

implementing of Greene's method on other graphical systems.

13.   Claims 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ned Greene

1996 ACM-0-89791-746-4/96/008 titled "Hierarchical Polygon Tiling with Coverage Masks".

14.   Claim 16:

(a) The claim 16 encompasses the same scope of invention as that of claim 1 except

additional claimed limitation of a computer-readable medium containing a program for

antialiasing a graphical image on a display.

(b) The Greene reference has taught a polygon tiling algorithm for providing antialiasing

of a graphical image on a display (see the abstract).

(c) The Greene reference however does not particularly disclose a computer-readable

medium.

(d) However, one of ordinary skill in the art would have recognized that computer

readable medium (i.e., floppy, cd-rom, etc.) carrying computer-executable instructions for

implementing a method, because it would facilitate the transporting and installing of the method

on other systems, is generally well-known in the art. For example, a copy of the Microsoft

Windows operating system can be found on a cd-rom from which Windows can be installed onto

other systems, which is a lot easier than running a long cable or hand typing the software onto

another system. The Office takes Official Notice of this teaching.

(e) Therefore, it would have been obvious to put Greene's program on a computer readable medium, because it would facilitate the transporting, installing and implementing of Greene's program on other systems.

Claim 17:

The claim 17 encompasses the same scope of invention as that claims 16, 4, and 5. The claim is rejected for the same reason as set forth in claim 16, 4 and 5.

Claim 18:

The claim 18 encompasses the same scope of invention as that claims 16 and 7. The claim is rejected for the same reason as set forth in claim 16 and 7.

Claim 19:

The claim 19 encompasses the same scope of invention as that claims 16 and 9. The claim is rejected for the same reason as set forth in claim 16 and 9.

Claim 20:

The claim 20 encompasses the same scope of invention as that claims 16 and 10. The claim is rejected for the same reason as set forth in claim 16 and 10.

15.   Claim 21:

(a) The claim 21 encompasses the same scope of invention as that of claim 11 except additional claimed limitation of a computer-readable medium containing a program for antialiasing a graphical image on a display.

(b) The Greene reference has taught a polygon tiling algorithm for providing antialiasing of a graphical image on a display (see the abstract).

(c) The Greene reference however does not particularly disclose a computer-readable medium.

(d) However, one of ordinary skill in the art would have recognized that computer readable medium (i.e., floppy, cd-rom, etc.) carrying computer-executable instructions for implementing a method, because it would facilitate the transporting and installing of the method on other systems, is generally well-known in the art. For example, a copy of the Microsoft Windows operating system can be found on a cd-rom from which Windows can be installed onto other systems, which is a lot easier than running a long cable or hand typing the software onto another system. The Office takes Official Notice of this teaching.

(e) Therefore, it would have been obvious to put Greene's program on a computer readable medium, because it would facilitate the transporting, installing and implementing of Greene's program on other systems.

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.   Wong et al. U.S. Patent No. 6,201,545 discloses a method and apparatus for providing video graphics processing that includes anti-aliasing.

b.   Jouppi et al. U.S. Patent No. 6,128,000 discloses a method and an apparatus for reducing aliasing artifacts in images defined by pixels.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (703) 605-1213. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jcw

JEFFERY BRIER
PRIMARY EXAMINER